WE CLAIM:

1. A method of forming silver-rich silver selenide in a resistance variable material cell, comprising:

forming a layer of silver selenide on a substrate assembly;

selectively oxidizing the layer of silver selenide with oxygen; and

annealing the layer of implanted silver selenide such that the implanted silver selenide is essentially free of selenium oxide.

2. The method as defined in Claim 1, wherein the selectively oxidizing comprises ion implantation.

3. The method as defined in Claim 2, wherein implanting further comprises implanting at least 2% of oxygen is implanted.

4. The method as defined in Claim 2, wherein oxygen is implanted to a depth between about 0 and about 500 angstroms (Å).

5. The method as defined in Claim 2, wherein oxygen is implanted to a depth between about 50 and about 100 angstroms (Å).

6. The method as defined in Claim 1, wherein annealing further comprises maintaining a temperature between about 50 degrees centigrade (C) to 130 degrees C for about 30 minutes to 3 hours.

7. The method as defined in Claim 1, wherein annealing further comprises maintaining a sufficient temperature so that a vapor pressure of selenium oxide is greater than a pressure maintained in an annealing chamber.

8. The method as defined in Claim 1, further comprising repeating implanting and annealing a predetermined number of times to increase an amount of silver in the silver-rich silver selenide ($Ag_{2+x}Se$).

9. The method as defined in Claim 1, further comprising:

applying a pattern mask over the layer of silver selenide prior to implanting the layer of silver selenide with oxygen; and

removing the pattern mask prior to annealing.

10. A method of forming memory cells in a programmable conductor random access memory (PCRAM) comprising:

(a) forming a plurality of electrodes;

(b) forming a layer of chalcogenide glass;

(c) forming a layer of silver selenide adjacent to the layer of chalcogenide glass;

(d) forming a mask pattern over the layer of silver selenide;

(e) implanting unmasked portions of the layer of silver selenide with oxygen;

(f) removing the mask pattern;

(g) annealing the layer of implanted silver selenide such that the layer is essentially free of selenium oxide thereby forming silver-rich regions of silver selenide; and

(h) patterning to define cells, where patterning selectively removes unenriched regions of silver selenide.

11. The method as defined in Claim 10, further comprising repeating (d) to (g) to further increase an amount of silver in the silver-rich regions of silver selenide.

12. The process as defined in Claim 10, further comprising forming electrodes in a cross-point configuration.

13. The process as defined in Claim 10, wherein the layer of chalcogenide glass is formed before forming the layer of silver selenide.

14. The process as defined in Claim 10, wherein the layer of chalcogenide glass is formed after forming, implanting, annealing, and patterning the layer of silver selenide.

15. A process to increase a ratio of silver to a chalcogenide material in a composition of silver chalcogenide, the process comprising:

providing silver chalcogenide; and

removing a selected amount of chalcogenide from the silver chalcogenide.

16. The process as defined in Claim 15, wherein removing the selected amount of chalcogenide further comprises:

implanting oxygen to the silver chalcogenide; and

annealing the oxygen-implanted silver chalcogenide.

17. The process as defined in Claim 16, further comprising repeating implanting and annealing for a predetermined number of times to further increase the ratio of silver to chalcogenide.

18. The process as defined in Claim 16, wherein the silver chalcogenide is selected from the group consisting of silver selenide, silver telluride, and silver sulfide.

19. The process as defined in Claim 16, wherein the silver chalcogenide is silver selenide.